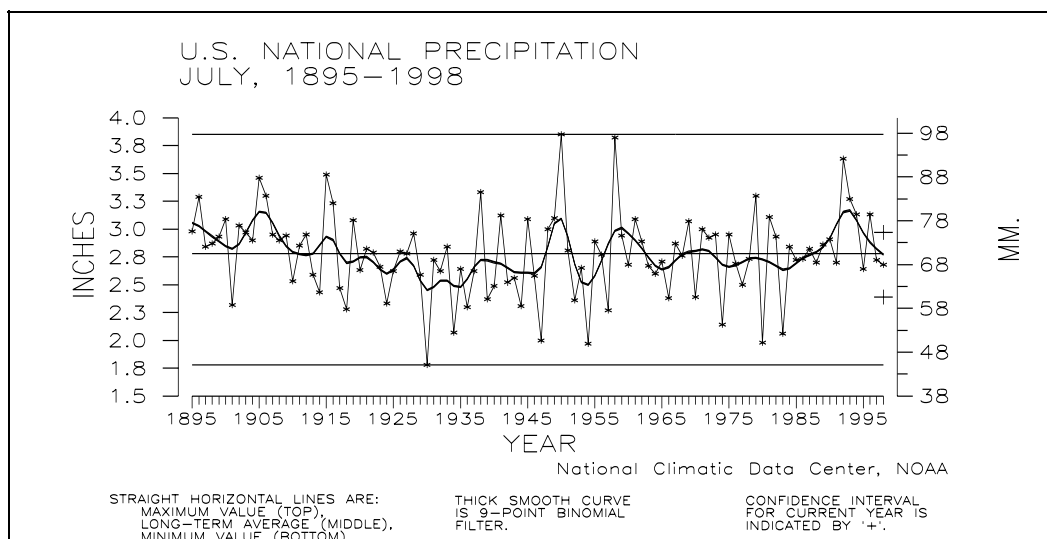
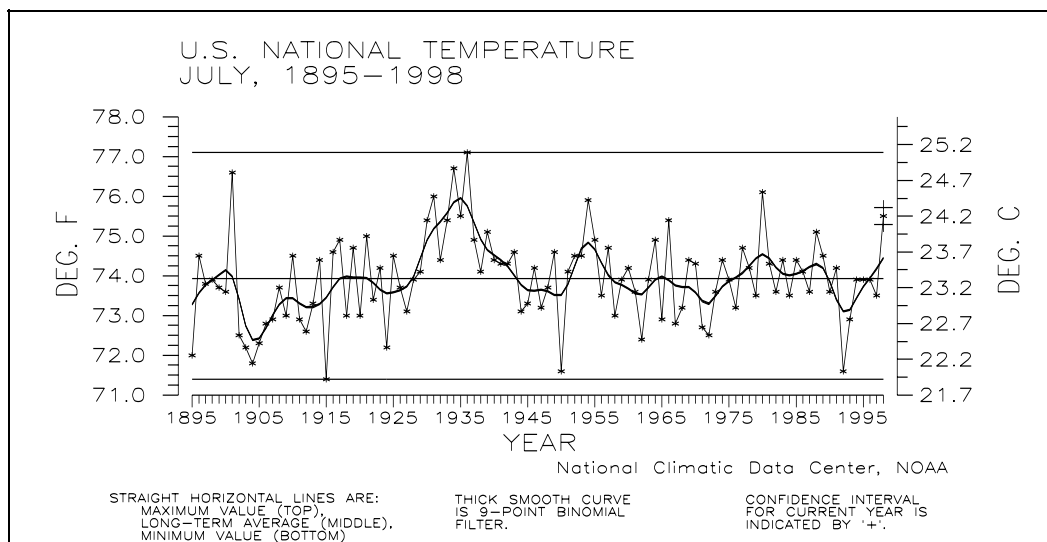


CLIMATE VARIATIONS BULLETIN



This CLIMATE VARIATIONS BULLETIN (CVB) is a preliminary report that puts current monthly climate anomalies into historical perspective using climate databases archived at the National Climatic Data Center (NCDC). It is issued on a monthly basis. Supplemental sections are included which address seasonal and annual perspectives, when appropriate.

Current data are based on preliminary reports from River Forecast Center stations and First and Second Order airport stations obtained from the National Weather Service (NWS) Climate Prediction Center. **THE CURRENT DATA SHOULD BE USED WITH CAUTION.** These preliminary data are useful for estimating how current anomalies compare to the historical record, however the actual values and rankings for the current year will change as the final data arrive at NCDC and are processed.

The following NCDC datasets are used for the historical data: the climate division drought database (TD-9640), and the hurricane datasets (TD-9636 and TD-9697). It should be noted that the climate division drought database consists of monthly data for 344 climate divisions in the contiguous United States. These divisional values are calculated from the 6000+ station Cooperative Observer network.

If you are a climate researcher and would like to order copies of the historical datasets used to make graphs of the type in this report, call 828-271-4994 or fax a letter to 828-271-4876 or mail a letter to the address given below, ATTN: Research User Services.

All other questions or requests for data should be made by calling 828-271-4800 or sending a fax to 828-271-4876 or by writing to:

National Climatic Data Center, NOAA
Federal Building
151 Patton Avenue, Room 120
Asheville, NC 28801-5001

If you use any of the information from this CVB, please identify "National Climatic Data Center, NOAA" as the source.

UNITED STATES JULY CLIMATE IN HISTORICAL PERSPECTIVE

William O. Brown
Alan Basist
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TABLE 1. PRECIPITATION AND TEMPERATURE RANKS, BASED
ON THE PERIOD 1895-1998. 1 = DRIEST/COLDEST,
104 = WETTEST/WARMEST FOR JULY 1998,
104 = WETTEST/WARMEST FOR JUN-JUL 1998,
104 = WETTEST/WARMEST FOR FEB-JUL 1998,
103 = WETTEST/WARMEST FOR AUG 1997-JUL 1998.

REGION	JUL 1998	JUN-JUL 1998	FEB-JUL 1998	AUG 1997- JUL 1998
-----	----	-----	-----	-----
PRECIPITATION:				
NORTHEAST	9	79	92	93
EAST NORTH CENTRAL	14	69	82	52
CENTRAL	75	100	93	72
SOUTHEAST	35	15	76	98
WEST NORTH CENTRAL	72	94	83	79
SOUTH	39	16	11	42
SOUTHWEST	92	87	85	96
NORTHWEST	77	68	81	84
WEST	76	100	104	102
NATIONAL	38	61	89	96
TEMPERATURE:				
NORTHEAST	35	36	102	97
EAST NORTH CENTRAL	58	40	101	101
CENTRAL	42	59	95	88
SOUTHEAST	90	101	84	63
WEST NORTH CENTRAL	85	40	90	97
SOUTH	101	102	94	84
SOUTHWEST	87	49	42	68
NORTHWEST	101	84	88	98
WEST	84	41	18	59
NATIONAL	97	76	95	100

TABLE 2. EXTREMES, 1961-90 NORMALS, AND 1998 VALUES FOR JULY. IT SHOULD BE NOTED THAT THE 1998 VALUES WILL CHANGE WHEN THE FINAL DATA ARE PROCESSED.

REGION	PRECIPITATION (INCHES)				NORMAL PCPN	1998 PCPN
	DRIEST VALUE	YEAR	WETTEST VALUE	YEAR		
NORTHEAST	2.02	1968	6.57	1897	3.81	2.71
EAST NORTH CENTRAL	.85	1936	6.13	1993	3.61	2.48
CENTRAL	1.47	1930	8.27	1958	4.25	4.57
SOUTHEAST	2.94	1983	11.55	1916	5.56	5.09
WEST NORTH CENTRAL	.84	1917	5.56	1993	2.02	2.26
SOUTH	1.34	1980	6.04	1950	3.03	2.81
SOUTHWEST	1.00	1993	3.51	1911	1.83	2.58
NORTHWEST	.16	1953	2.05	1983	.73	.82
WEST	.00	1903	1.18	1984	.34	.38
NATIONAL	1.78	1930	3.85	1950	2.74	2.68*

* PRELIMINARY VALUE, CONFIDENCE
INTERVAL + OR - .29 INCHES

REGION	TEMPERATURE (DEGREES F)				NORMAL TEMP	1998 TEMP
	COLDEST VALUE	YEAR	WARMEST VALUE	YEAR		
NORTHEAST	66.1	1962	73.8	1955	69.3	69.0
EAST NORTH CENTRAL	64.0	1992	76.2	1936	70.2	70.2
CENTRAL	71.9	1947	81.2	1901	75.3	75.3
SOUTHEAST	76.3	1947	82.7	1993	78.6	80.4
WEST NORTH CENTRAL	62.7	1915	77.4	1936	69.5	71.4
SOUTH	78.0	1906	85.9	1980	81.3	84.6
SOUTHWEST	70.1	1912	75.9	1901	73.6	74.4
NORTHWEST	58.9	1993	70.6	1906	65.9	69.4
WEST	69.0	1903	78.2	1931	73.8	75.4
NATIONAL	71.4	1915	77.1	1936	73.9	75.5*

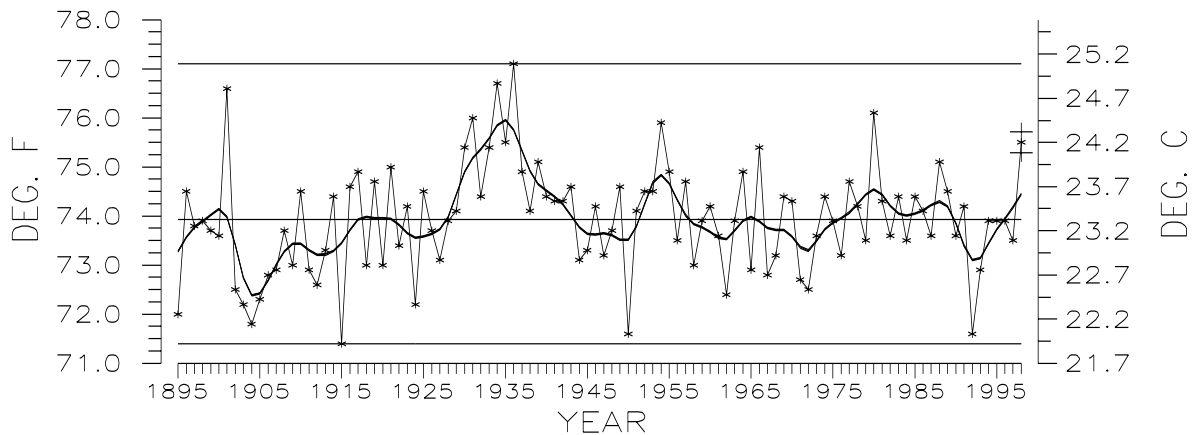
* PRELIMINARY VALUE, CONFIDENCE
INTERVAL + OR - .2 DEG. F.

TABLE 3.

STATISTICS FOR SELECTED RIVER BASINS: PRECIPITATION RANKING FOR OCT-JUL 1997-98, WHERE RANK OF 1 = DRIEST, 103 = WETTEST, BASED ON THE PERIOD 1895 TO 1998, AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) DROUGHT, AND AREAL PERCENT OF THE BASIN EXPERIENCING SEVERE OR EXTREME LONG-TERM (PALMER) WET CONDITIONS, AS OF JULY 1998.
RIVER BASIN REGIONS AS DEFINED BY THE U.S. WATER RESOURCES COUNCIL.

RIVER BASIN -----	PRECIPITATION RANK -----	% AREA DRY -----	% AREA WET -----
MISSOURI BASIN	92	1.8%	39.8%
PACIFIC NORTHWEST BASIN	74	.0%	48.0%
CALIFORNIA RIVER BASIN	102	.0%	100.0%
GREAT BASIN	100	.0%	100.0%
UPPER COLORADO BASIN	67	.0%	51.4%
LOWER COLORADO BASIN	82	.0%	37.6%
RIO GRANDE BASIN	26	11.1%	4.9%
ARKANSAS-WHITE-RED BASIN	58	1.8%	16.3%
TEXAS GULF COAST BASIN	40	64.2%	.0%
SOURIS-RED-RAINY BASIN	68	.0%	29.3%
UPPER MISSISSIPPI BASIN	92	.0%	14.1%
LOWER MISSISSIPPI BASIN	49	10.6%	8.5%
GREAT LAKES BASIN	31	13.0%	.0%
OHIO RIVER BASIN	47	.0%	.0%
TENNESSEE RIVER BASIN	82	.0%	39.6%
NEW ENGLAND BASIN	90	.0%	13.5%
MID-ATLANTIC BASIN	98	.0%	4.9%
SOUTH ATLANTIC-GULF BASIN	100	7.7%	2.6%

U.S. NATIONAL TEMPERATURE JULY, 1895-1998



National Climatic Data Center, NOAA

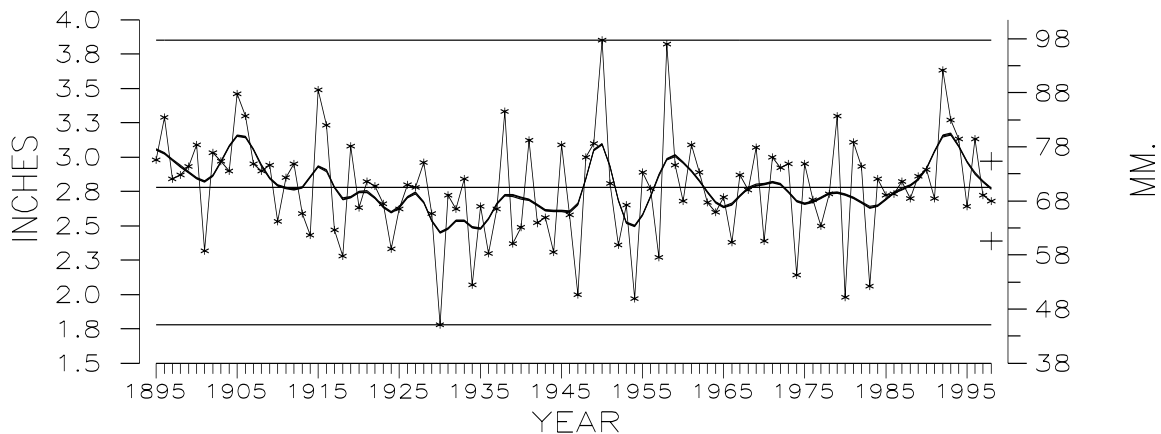
STRAIGHT HORIZONTAL LINES ARE:
MAXIMUM VALUE (TOP),
LONG-TERM AVERAGE (MIDDLE),
MINIMUM VALUE (BOTTOM)

THICK SMOOTH CURVE
IS 9-POINT BINOMIAL
FILTER.

CONFIDENCE INTERVAL
FOR CURRENT YEAR IS
INDICATED BY '+'.

Figure 1: Preliminary data for July 1998 indicate that temperature averaged across the contiguous United States was above the long-term mean ranking as the eighth warmest July since 1895. Over twenty-nine percent of the country was much warmer than normal while less than one percent of the country was much cooler than normal.

U.S. NATIONAL PRECIPITATION JULY, 1895-1998



National Climatic Data Center, NOAA

STRAIGHT HORIZONTAL LINES ARE:
MAXIMUM VALUE (TOP),
LONG-TERM AVERAGE (MIDDLE),
MINIMUM VALUE (BOTTOM)

THICK SMOOTH CURVE
IS 9-POINT BINOMIAL
FILTER.

CONFIDENCE INTERVAL
FOR CURRENT YEAR IS
INDICATED BY '+'.

Figure 2: July 1998 was the 38th driest such month since 1895. Over 11% of the country experienced much drier than normal conditions while about 12% of the country was much wetter than normal.

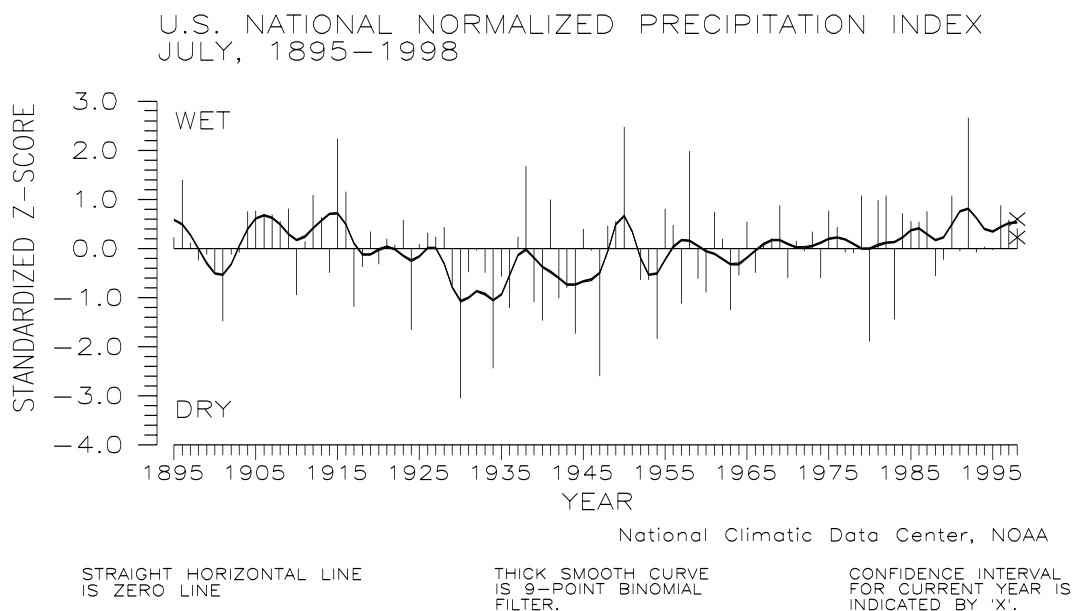


Figure 3: The preliminary national standardized precipitation index ranked July 1998 as the 38th wettest such month on record. This standardized z-score is estimated to be accurate to within 0.188 index units and its confidence interval is shown as an 'X'.

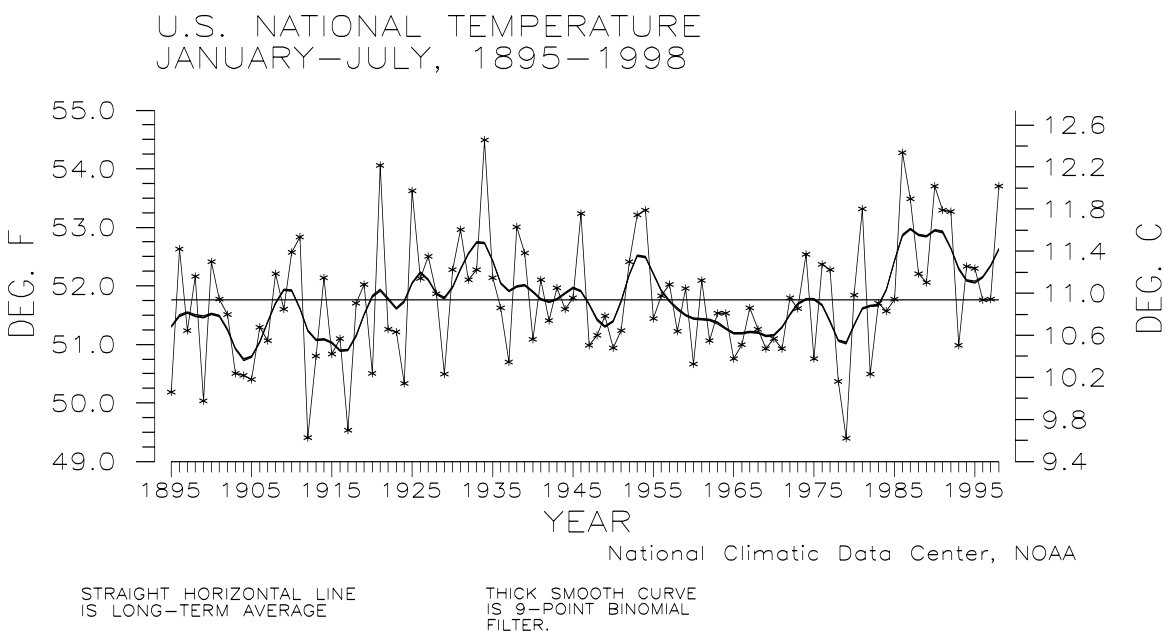


Figure 4: Based upon preliminary data, January-July 1998 was the 5th warmest such period on record. Over 47% percent of the country had much warmer than normal January-July temperatures while none of the country was much cooler than normal. Ten of the last fourteen such seven-month periods have been above- to much-above the long-term mean.

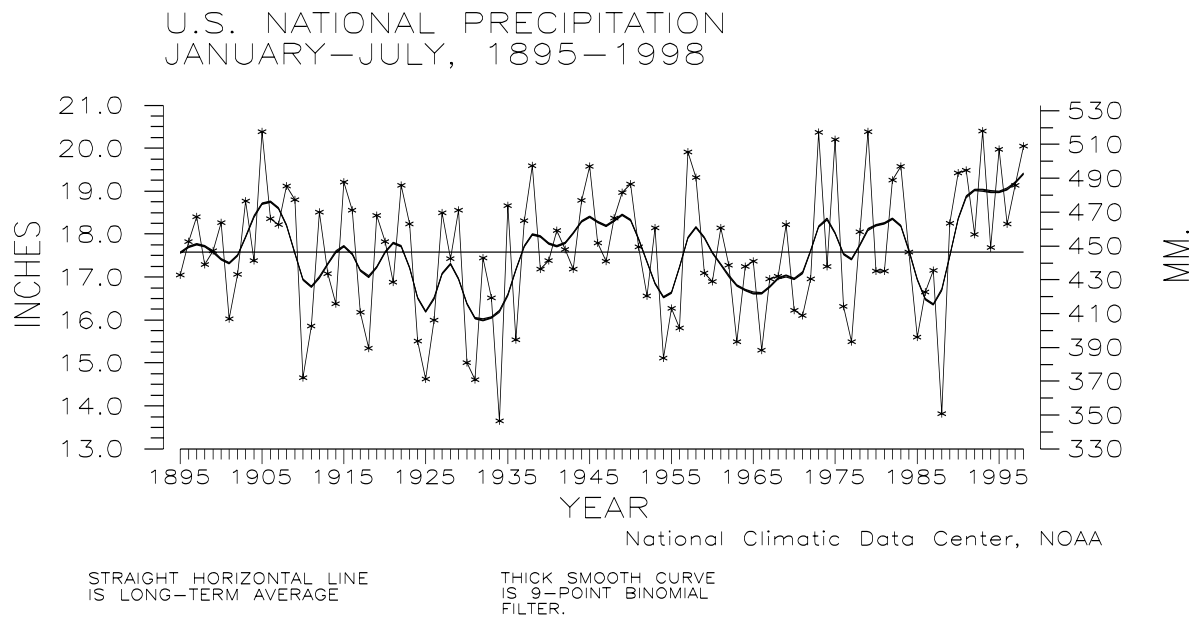


Figure 5: Preliminary precipitation data indicate that the year-to-date, January-July 1998, was the sixth wettest such seven-month period since records began. About 30% of the country was much wetter than normal while about four percent of the country was much drier than normal. Each of the previous ten such seven-month periods have had precipitation above- to much-above the long-term mean.

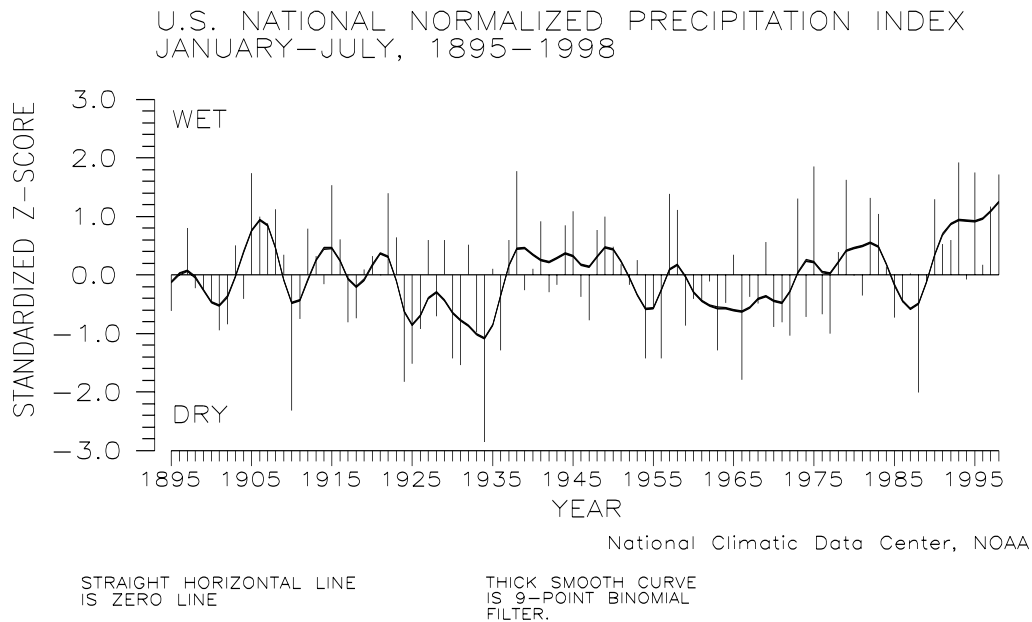


Figure 6: The preliminary national year-to-date standardized precipitation index ranked January-July 1998 as the sixth wettest such period since 1895.

U.S. PERCENT AREA DRY AND WET JANUARY 1994 THROUGH JULY 1998

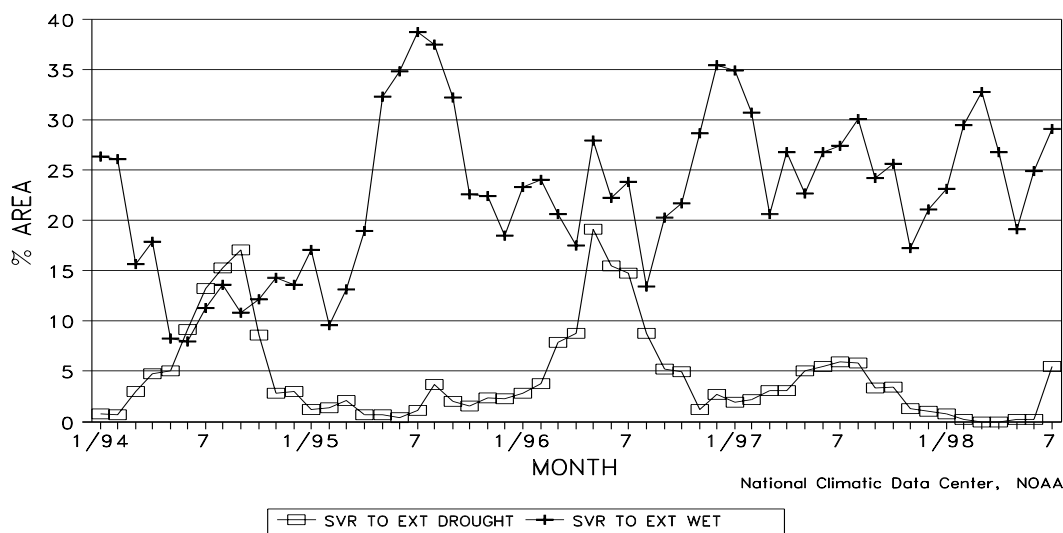


Figure 7: Long-term drought coverage (as measured by the Palmer Drought Index) showed a significant jump over June, with July 1998 having nearly six percent of the country in severe to extreme drought. The percent area of the country experiencing severe to extreme wetness climbed as well to near 29%. The core dry areas included upper-Michigan, central Florida, and southern and northeastern Texas, while core wet areas included California, the Great Basin, portions of the Southwest, the northern and central Rockies, and the northern and central Great Plains,

PRIMARY CORN AND SOYBEAN BELT PRECIPITATION MARCH–JULY, 1895–1998

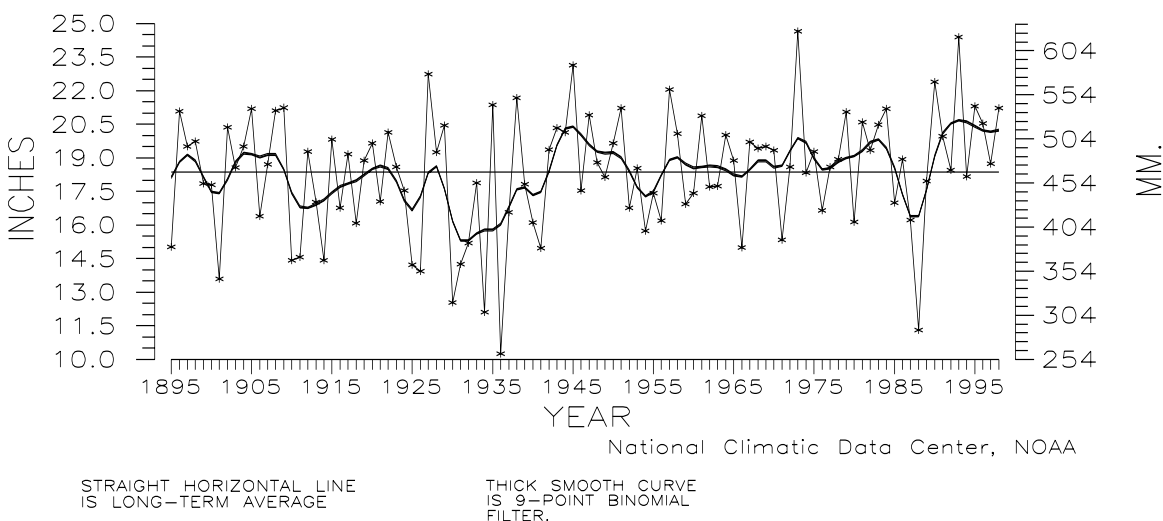


Figure 8: Preliminary data indicate that precipitation averaged across the Primary Corn and Soybean agricultural belt was above the long-term mean for the growing-season-to-date.

NORTHEAST REGION PRECIPITATION JULY, 1895–1998

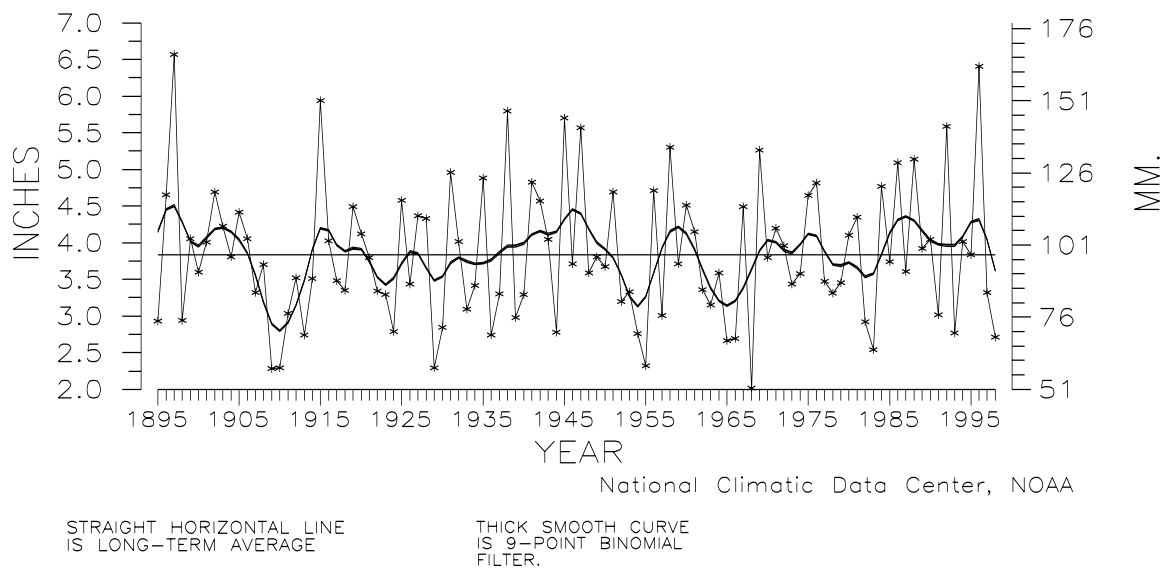


Figure 9: Preliminary data ranked July 1998 as the ninth driest such period on record for the Northeast Region. The Northeast Region includes each state from Maryland and Pennsylvania, north and east.

SOUTHWEST REGION PRECIPITATION JULY, 1895–1998

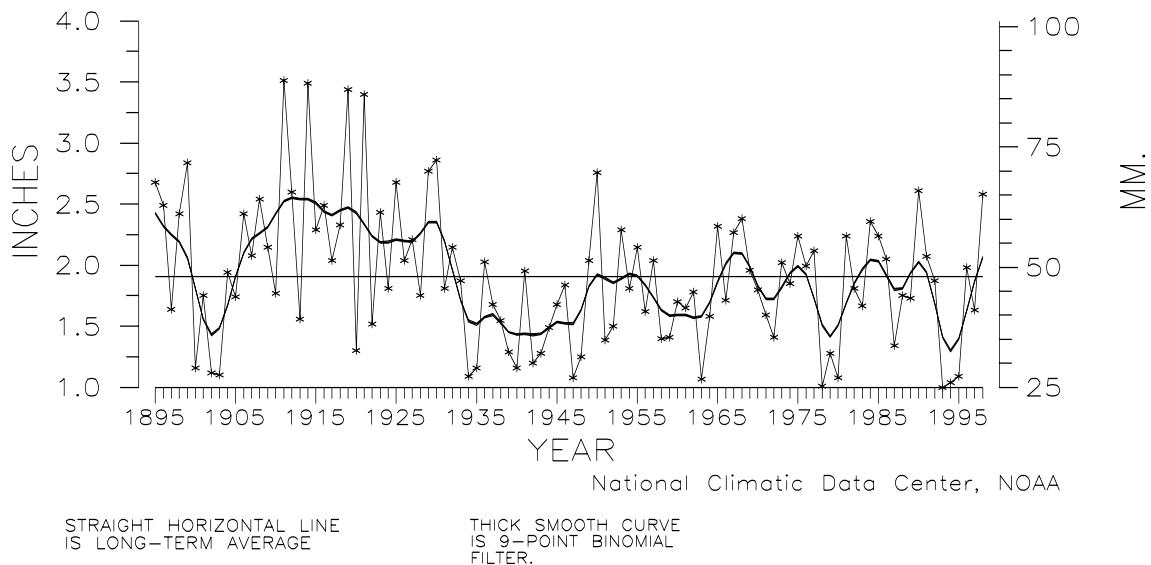


Figure 10: Preliminary data ranked July 1998 as the 13th wettest such month on record for the Southwest Region. The Southwest Region includes Arizona, Colorado, New Mexico, and Utah.

NORTHEAST REGION TEMPERATURE JULY, 1895–1998

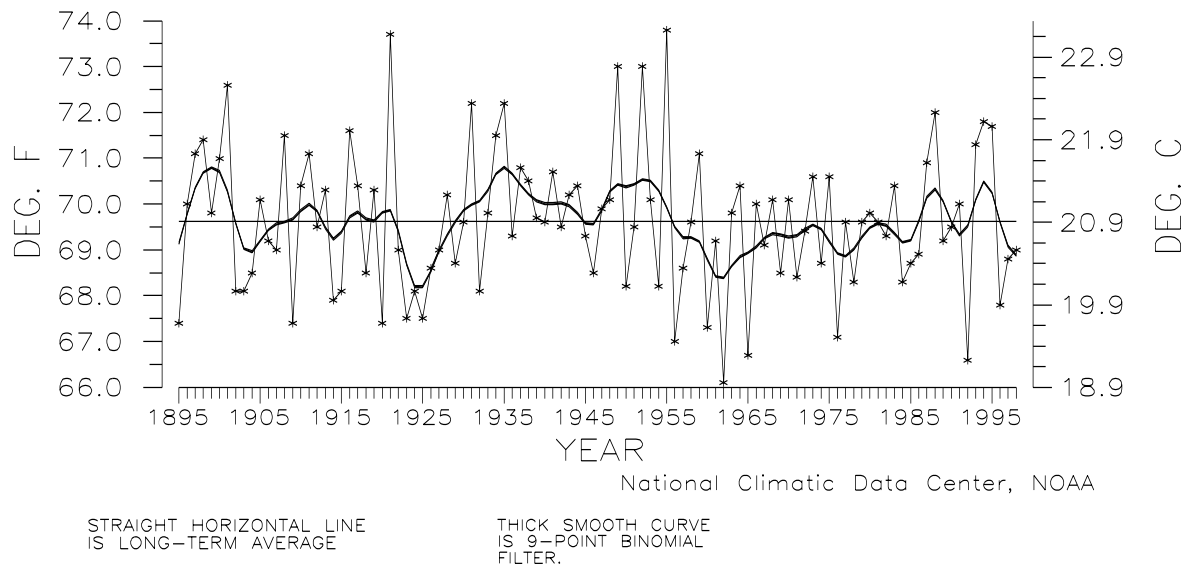


Figure 11: Preliminary data ranked July 1998 as the 35th coolest such period on record for the Northeast Region.

SOUTH REGION TEMPERATURE JULY, 1895–1998

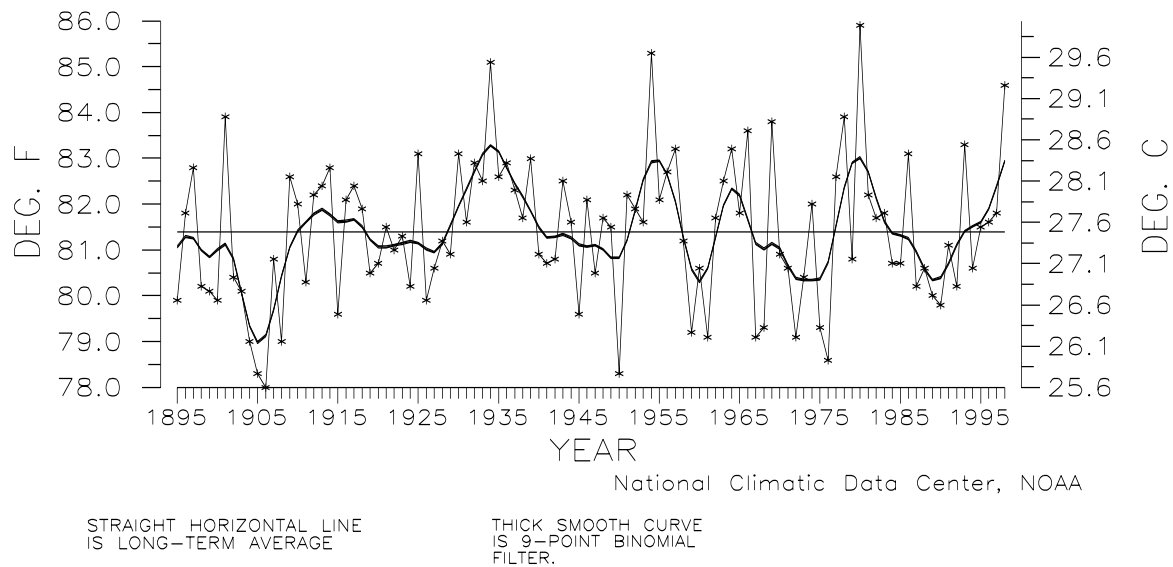


Figure 12: Preliminary data ranked July 1998 as the fourth warmest such month on record for the South Region. The South Region includes Arkansas, Kansas, Louisiana, Mississippi, Oklahoma, and Texas.

SOUTHEAST REGION PRECIPITATION JANUARY–JULY, 1895–1998

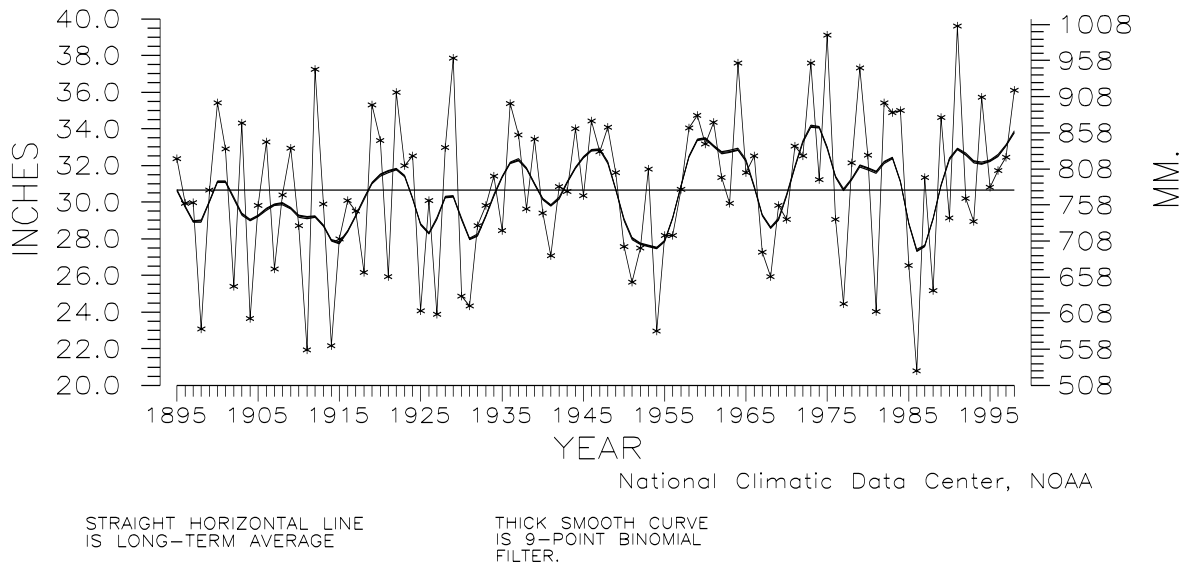


Figure 13: Preliminary data ranked January-July 1998 as the eighth wettest such period on record for the Southeast Region. The Southeast Region includes Virginia, the Carolinas, Georgia, Florida, and Alabama.

NORTHEAST REGION TEMPERATURE JANUARY–JULY, 1895–1998

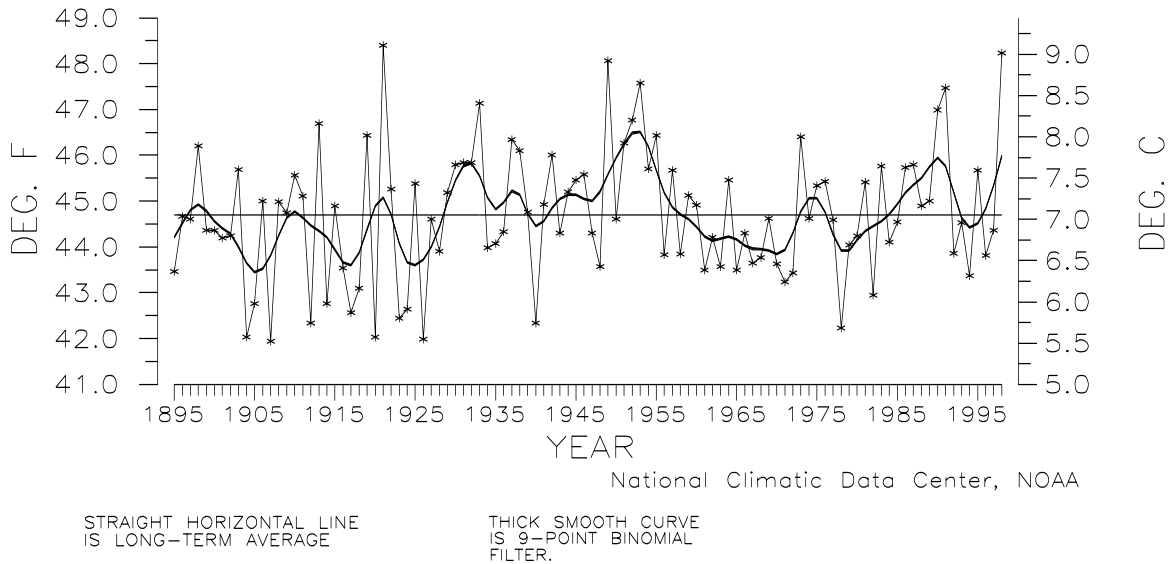


Figure 14: Preliminary data ranked January-July 1998 as the second warmest such year-to-date on record for the Northeast Region.

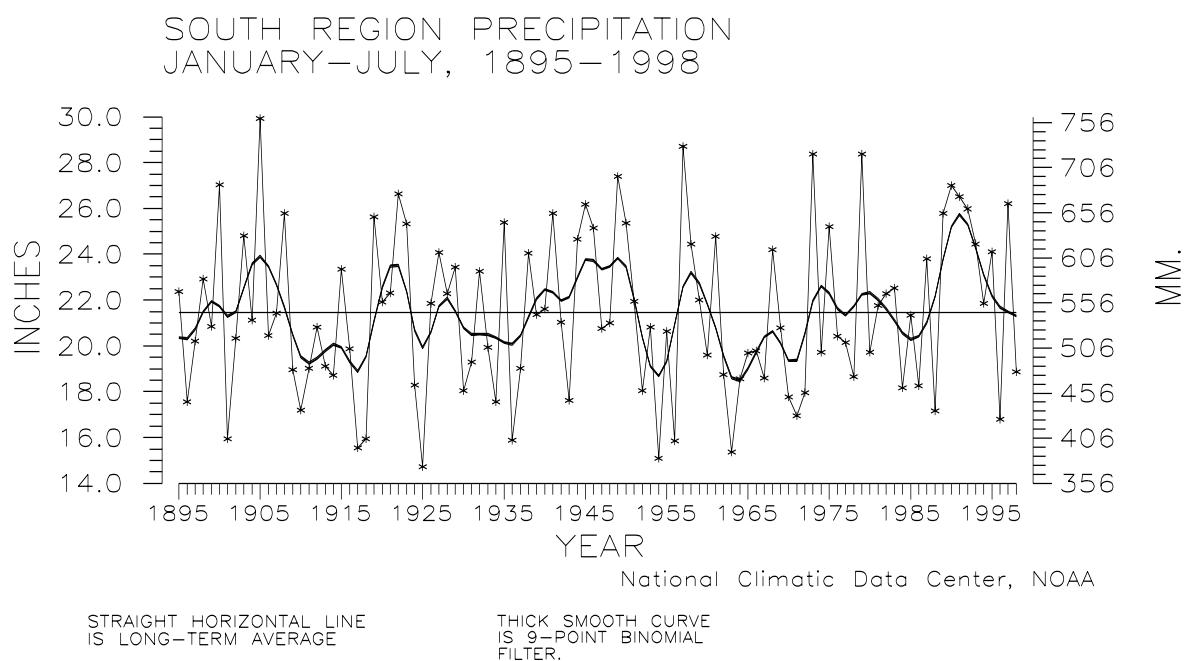


Figure 15: Preliminary data ranked January-July 1998 as the 28th driest such period on record for the South Region.

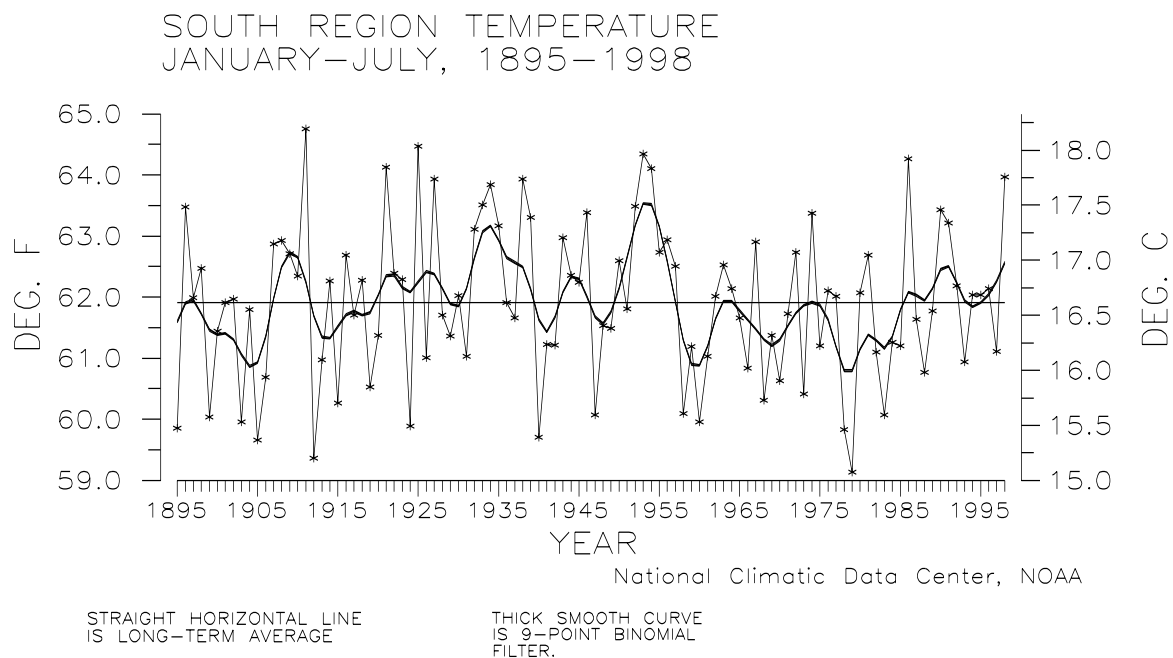
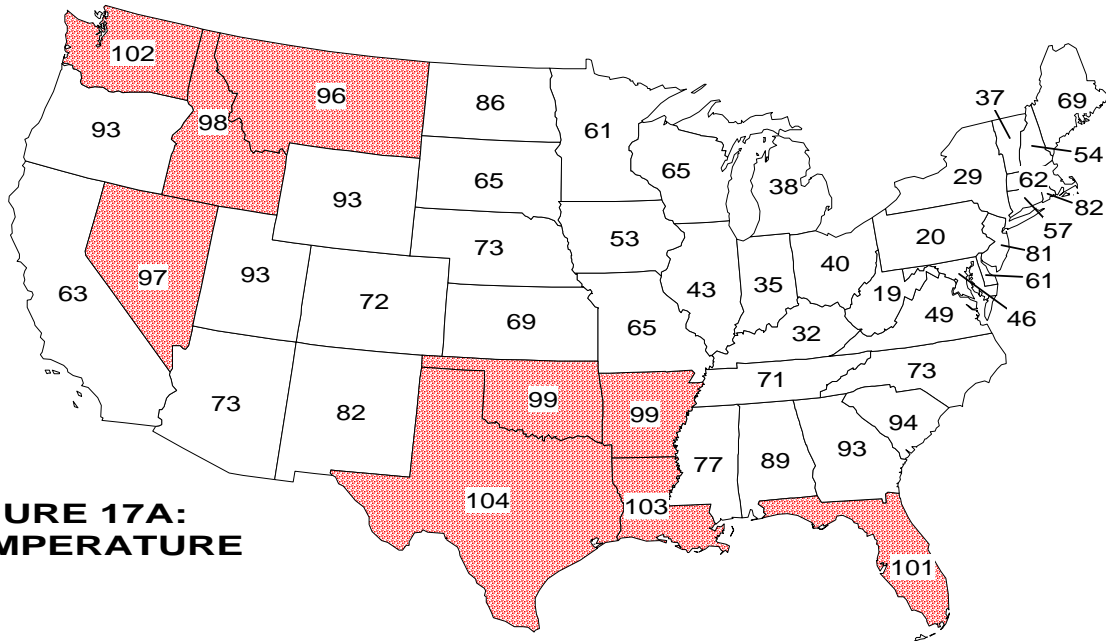
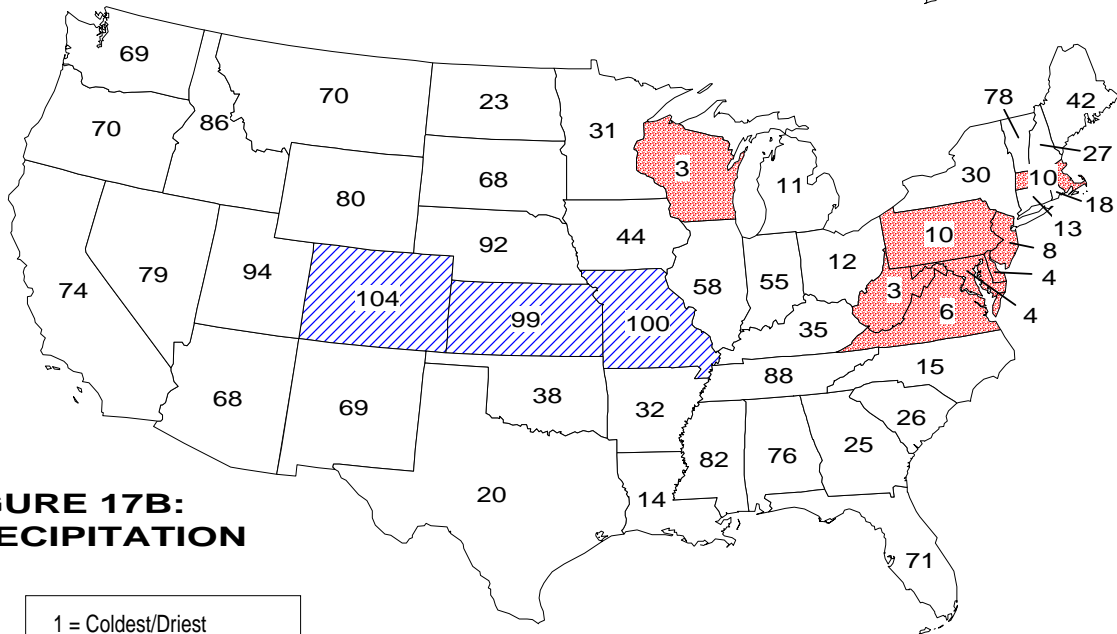


Figure 16: Preliminary data ranked January-July 1998 as the seventh warmest such year-to-date on record for the South Region.

JULY 1998 STATEWIDE RANKS



**FIGURE 17A:
TEMPERATURE**



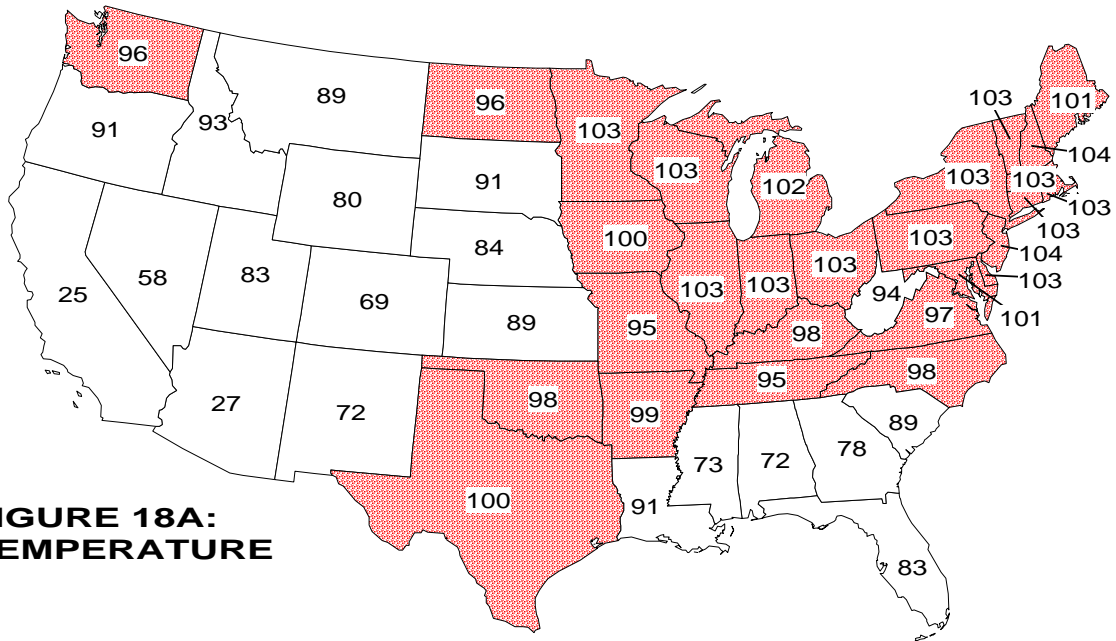
**FIGURE 17B:
PRECIPITATION**

1 = Coldest/Driest
104 = Warmest/Wettest

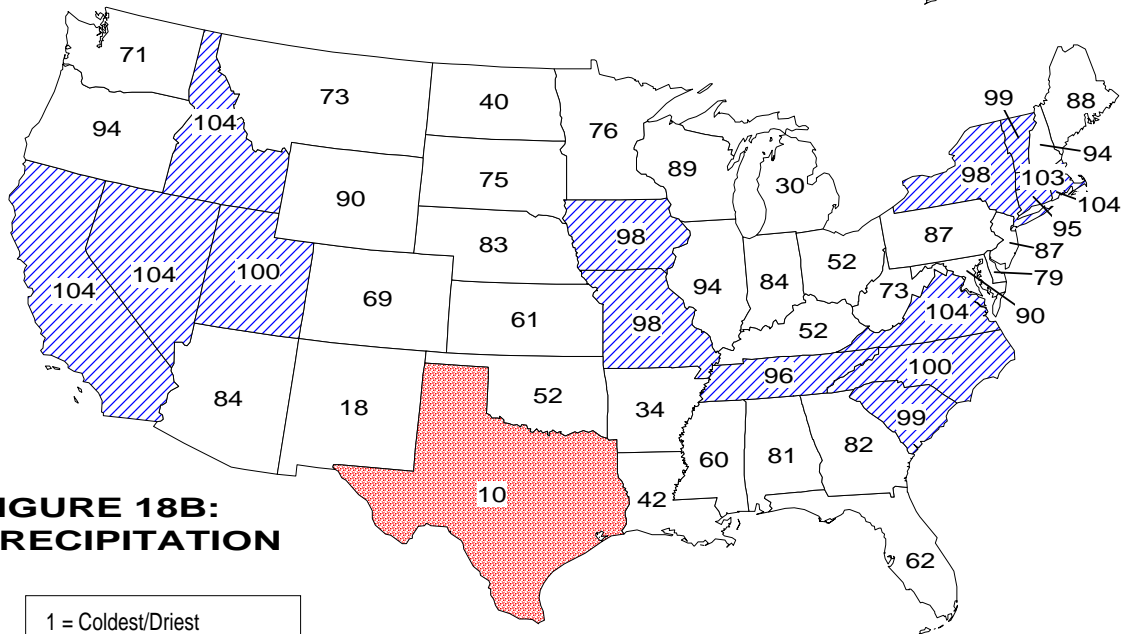
National Climatic Data Center, NOAA

Temperature and Precipitation Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1998. States having a rank of top ten coldest or driest (rank 1-10) or top ten warmest or wettest (rank 95-104) are shaded.

JAN-JULY 1998 STATEWIDE RANKS



**FIGURE 18A:
TEMPERATURE**



**FIGURE 18B:
PRECIPITATION**

1 = Coldest/Driest
104 = Warmest/Wettest

National Climatic Data Center, NOAA

Temperature and Precipitation Ranks for the contiguous United States. Each state is ranked based on its data from 1895-1998. States having a rank of top ten coldest or driest (rank 1-10) or top ten warmest or wettest (rank 95-104) are shaded.

SSMI MEAN TEMP. ANOMALY IN CELSIUS JULY 1998

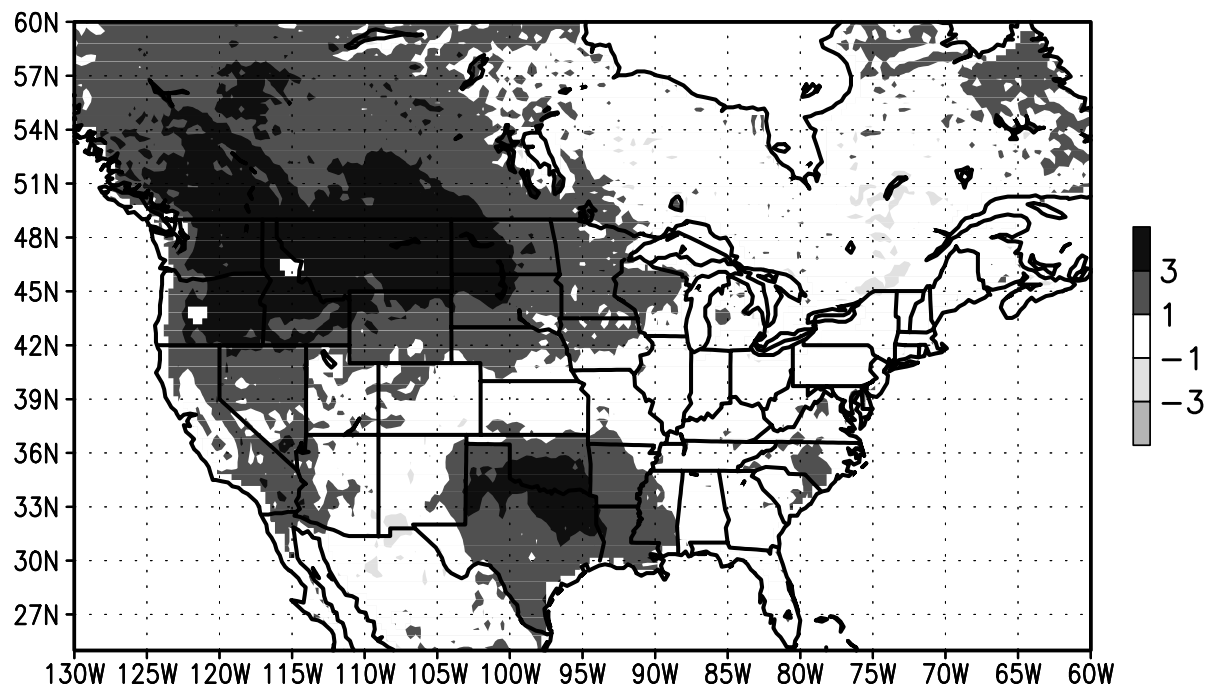


Figure 19

SURFACE WETNESS ANOMALY (%) JULY 1998

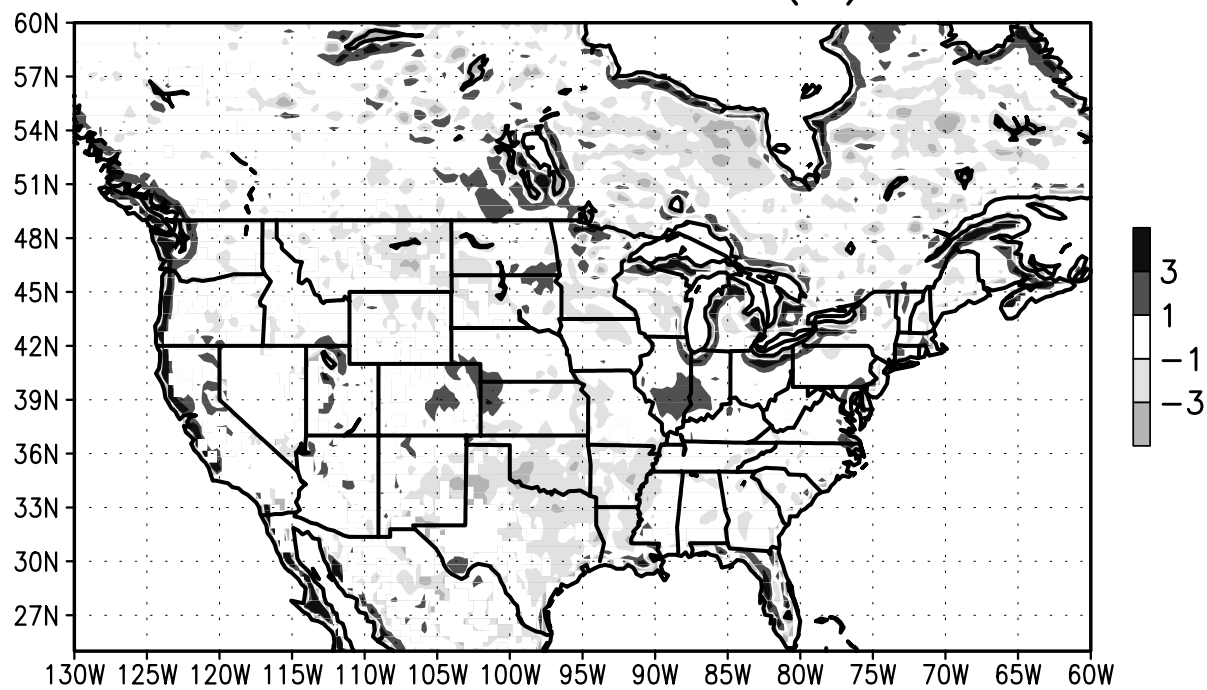


Figure 20

Figure 17A shows, in illustrative map form, the July 1998 temperature rankings for the 48 contiguous states. Nine states were within the top ten warm portion of the historical distribution including the warmest July on record for Texas, the second warmest July since 1895 for Louisiana, the third warmest July on record for Washington, and the fourth warmest July since 1895 for Florida. Sixteen additional states ranked within the warm third of the historical distribution. Only five states ranked within the cool third of the distribution.

July 1998 state ranks for precipitation are shown in **Figure 17B**. Three states ranked within the top ten wet portion of the distribution while thirteen others ranked within the wet third portion of the distribution. Eight states also ranked within the top ten dry portion of the historical distribution while fifteen others ranked within the dry third. ***It should be noted that these July state categorical precipitation ranks are preliminary and should be used with considerable caution due to the high variability of precipitation on a small space and time scale.***

Year-to-date statewide temperature and precipitation ranks are shown in **Figures 18A and 18B**. Twenty-eight states ranked within the top ten warm portion of the historical distribution including the warmest such seven-month period on record for New Hampshire and New Jersey. It was the second warmest January-July period since 1895 for Connecticut, Delaware, Illinois, Indiana, Massachusetts, Minnesota, New York, Ohio, Pennsylvania, Rhode Island, Vermont, and Wisconsin. Fourteen other states ranked within the warm third of the distribution. No state was within the top ten cool and only two ranked within the cool third of the distribution (AZ and CA). Fifteen states had their tenth wettest or wetter January-July period including the wettest such period on record for California, Idaho, Nevada, Rhode Island, and Virginia. Twenty others ranked within the wet third portion of the distribution. One state (Texas) was within the top ten dry portion of the distribution for the seven-month period while three others (AR, MI, & NM) ranked within the dry third of the historical distribution for the January-July period.

It should be emphasized that all of the temperature and precipitation ranks on these maps and in Table 1 are based on preliminary data. The ranks will change when the final data are processed.

Figure 19 shows mean monthly temperature anomalies for the month of July 1998. The base period is seven years (1992-1998). This experimental product is derived from the Special Sensor Microwave Imager (SSM/I), an instrument flown on a polar orbiting satellite of the defense meteorological satellite program. The anomalies are in degrees Celsius. Above normal temperatures covered the western and northern plains states, where a ridge of high pressure dominated most of the month. High pressure and warm anomalies extended into most of western Canada. This same center of high pressure was responsible for warm anomalies in Texas and Louisiana as well. In addition, much of the southeastern seaboard had above normal temperatures. There were few areas with below normal temperatures during the month of July.

Figure 20 shows the mean monthly surface wetness anomalies for July 1998. This product is derived from the SSM/I. Values represent the deviation from the climatological average, using a 1992-1998 base period. The wetness signature can be attributed to recent rain or its absence. The negative wetness anomalies over the south-central United States corresponds with the extreme drought and intense heat that plagued the region during most of the month. Another area of below normal wetness occurred over portions of the high plains and Midwest states. There was above normal wetness in portions of the central plains and the Ohio River valley. Areas of eastern Canada, south of Hudson Bay, also had below normal wetness during July. The full and anomalous surface wetness fields as well as the temperature and snow cover anomalies for North America and the globe can be seen in greater detail at <http://www.ncdc.noaa.gov/plwebapps/plsql/ssmimain>.